

1/25/2011

Equipment Authorization Guidance for Hearing Aid Compatibility

Introduction

This publication provides guidance¹ to clarify the Hearing Aid Compatibility (HAC) equipment certification requirements for wireless handsets subject to Section 20.19² of the FCC rules.

Wireless handsets that provide Commercial Mobile Radio Service (CMRS Section 20.9) using air interfaces and frequency bands for which technical standards are defined in ANSI C63.19–2007³ are subject to Section 20.19.

Manufacturers of wireless handsets that are hearing aid compatible⁴ (*i.e.* HAC rated) and subject to Section 20.19 must submit, as part of the equipment certification process, test report exhibit(s) demonstrating the HAC rating, tested according to the ANSI C63.19–2007 standard.

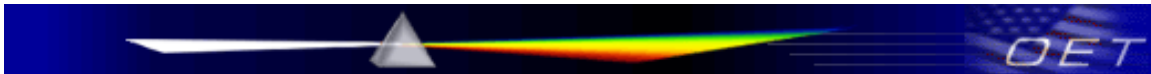
This published revision (285076 D01 HAC Guidance v01r01) reflects changes to the equipment authorization procedure based on the FCC rules that became effective October 8, 2010.² A brief overview of the changes is provided in Appendix B below.

¹ Telecommunication Certification Bodies (TCBs), test laboratories, and manufacturers can use this document for equipment certification guidance; however, some requirements may only be applicable to TCBs - for example: grant comments and grant note identification entered on the Grant of Equipment Authorization.

² FCC 10-145 released August 5, 2010 and effective October 8, 2010 revised the Hearing Aid Compatibility rules of Section 20.19 and revised FCC 08-68 released February 28, 2008 effective June 6, 2008.

³ ANSI C63.19 IEEE - Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids

⁴ Service providers and manufacturers are required to make available (providers to customers and manufacturers to providers) a number or percentage of Hearing Aid-Compatible (HAC) handset models used in delivery of the digital Commercial Mobile Radio Service. The number is defined by a schedule in Section 20.19 (c) - *Phase-in of requirements relating to radio frequency interference*; and Section 20.19(d) - *Phase-in of requirements relating to inductive coupling capability*. Manufacturers and providers must also submit to the Federal Communications Commission Wireless Telecommunications Bureau (WTB) regular reports demonstrating compliance pursuant to a reporting schedule set out in Section 20.19(i) - *Reporting Requirements*. The handset (model/FCCID/HAC Rating/standard-version/availability) reported to the WTB must be validated by the supporting test report exhibits (FCCID/HAC Rating/standard-version) in the Equipment Authorization System (EAS). There is no requirement that the grant of certification and HAC report exhibits include an up-to-date model designation in the EAS for each model reported to the WTB.



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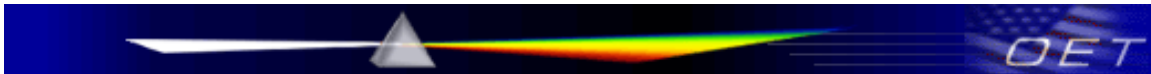
Equipment Certification

1. HAC test report exhibit(s) are submitted with a Form 731 application for equipment authorization, either as an original application, or as a Class II Permissive Change application to add or change the HAC rating of a handset subject to Section 20.19.
2. A Form 731 application associated with a hearing aid compatibility test report exhibit(s) must contain one complete M test report for model(s) marketed and reported as an M#, or one complete M and one complete T report (see example appendix A) for a model(s) marketed and reported as M#T#.
3. Test report exhibits demonstrating HAC compliance according to ANSI C63.19-2007 must be submitted for all of the handset's air interfaces/bands defined in the ANSI C63.19-2007 standard.⁵
4. For handsets capable of voice operations over multiple air interfaces/bands, only some of which are defined in ANSI C63.19-2007, a Form 731 application can be submitted for HAC compliance under the rules.⁶ All air interfaces/bands must be listed and noted in the test report. All air interfaces/bands not defined in C63.19-2007 capable of supporting voice⁷ shall be further indicated in the test reports list of air interfaces/bands.
5. Any device that can be held to the ear in any ordinary way, or found suitable to hold to the ear, is considered a handset under Section 20.19. This includes any device, even if the manufacturer claims that usually, or most often, users will operate it in a speakerphone or other mode. If a device cannot be practically used held to the ear for voice communication, it is not subject to the HAC requirements of Section 20.19. This includes devices that provide voice communication only through a speakerphone, headset or other instrument.
6. Concurrent connections or services are modes that permit active voice calls at the same time with other active connections for data, or other voice calls.

⁵ Note: By definition air interfaces/bands defined in C63.19-2007 support voice capabilities, while air interface bands not defined in C63.19 may or may not support voice capabilities.

⁶ Prior to the release of FCC 10-145 all air interface/bands had to be defined in C63.19, thus a handset that included air interfaces/bands capable of voice operations not defined in C63.19 was not subject to Section 20.19 and the handset could not be rated for HAC compliance. The only exception was for handsets that supported Wi-Fi capability. The rule now extends this to other air interfaces capable of voice operations.

⁷ A handset has the capability to support voice over an air interface/band if voice capability either: 1) is built into the handset as manufactured, 2) is available as an additional application, or 3) could be enabled through a third-party application, whether or not such application is currently commercially available. Only air interfaces/bands that do not have the ability for an application to use the ear piece and microphone for voice communications are considered not voice capable.

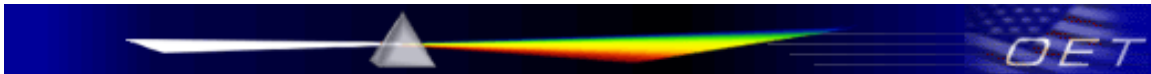


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- a. Handsets that have the ability to support concurrent connections using simultaneous transmissions⁸ shall be independently tested for each air interface/band defined in C63.19-2007 separately. The handset shall not be tested in the simultaneous transmission modes, which may include all air interfaces/bands (voice or data), whether or not defined in C63.19-2007.
 - b. Handsets that provide concurrent connections using other modes (such as time division multiplexing over the same air interface) with an air interface/band(s) defined in C63.19-2007, shall be tested in both modes (non-concurrent and concurrent) to determine the worst case mode for applying the HAC rating. The worst case mode shall be documented in the test report (See Item 10 (a)(v). below).
 - c. All air interfaces/bands that can be operated in concurrent connections mode with another air interface/band (simultaneous transmission or other concurrent connection mode) shall be indicated in the test report. The test report shall identify the mode (simultaneous transmission or other) and the operation with which the indicated mode is concurrent.
7. Manufacturers that qualify for the Global System for Mobile communications (GSM) 1900 MHz band power reduction option⁹ and provide test results where the HAC rating is based on reduced power in the 1900 MHz band, must provide in the Form 731 application filing a statement documenting that they are qualified, and must document the required information in the test report and user's manual exhibits as defined in items 10-13 below.
8. Handsets that only support air interfaces/bands not defined by ANSI C63.19-2007 are not subject to Section 20.19.
9. A Form 731 application for certification that shows test results in the M4 or M4T4 category cannot declare a lower rating (M3, M3T4). In all cases, the test report must have test results demonstrating the same rating declared by the manufacturer and reported to the Wireless Telecommunications Bureau.

⁸ Simultaneous transmissions occur when two transmitters are radiating simultaneously and operating over separate or the same air interfaces/bands, such that each air interface/band transmission is contributing to the radiated field. Currently ANSI C63.19 is reviewing the issue of testing simultaneous transmissions to address the measurement of simultaneous transmissions. Until the C63.19 Committee validates simultaneous transmissions results, devices offering this capability shall not be tested in the simultaneous transmission mode.

⁹ The option to meet the M3 HAC standard through a user-selectable power reduction for GSM operations in the 1900 MHz band (20.19 (e) (1) (c)) is available only to entities that otherwise would have qualified for the *de minimis* exception but must offer one hearing aid-compatible handset because of their size (20.19 (e) (1) (B)).



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Test Reports, Grant Notes and Comment Text

10. Test reports shall contain (in the introduction or a separate section):

- a. A list of all air interfaces and bands supported by the handset, indicating:
 - i. Air interfaces/frequency bands that are defined in ANSI C63.19-2007 (and must be tested);
 - ii. Air interfaces/frequency bands that are not defined (and cannot be tested);
 - iii. Air interfaces/frequency bands not tested that have the capability for supporting voice over data applications;⁷
 - iv. The combinations of air interface/bands that operate in simultaneous transmission mode; however, as noted in Item 6 above, such air interfaces are not to be tested in simultaneous transmission mode;
 - v. Concurrent service modes tested from a single transmitter, and the concurrent state that determined the HAC rating;
 - vi. If the GSM air interface in the 1900 MHz Band was tested using the option to reduce the power.¹⁰
- b. Applicants that require the power reduction option for GSM 1900 MHz band operation¹⁰ shall state the maximum power (required by C63.19-2007 clause 4.3.3) in the 1900 MHz band and the reduced power used for testing compliance to demonstrate compliance to the requirement that power be reduced by no more than 2.5 dB.

11. Grant Note Codes:

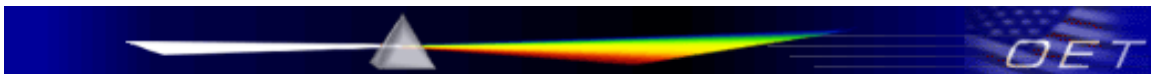
- a. Use a grant note code of “HC”¹⁰ in the grant note field for the frequency bands and air interfaces for which the tests have been conducted and HAC rating obtained;
- b. Use the grant note code “HX”¹¹ for the frequency bands and the air interfaces that have the ability to support voice over data applications but they have not been tested because they are not included in C63.19-2007 and the device has been found compliant with HAC rating in other frequency bands.

12. Grant Comments:

- a. For air interfaces/bands included in C63.19-2007 that has voice capability (for which the grant note HC is used) the text: *“This equipment complies with the hearing aid compatibility technical requirements of Section 20.19 of the rules”* will automatically be added to the grant. In addition:
 - i. Add the text indicating the HAC rating in the comment field: “HAC Rating M#T#.”

¹⁰ The grant note HC is applied to all line entries on the 731 form that represent the handsets air interfaces/bands defined in C63.19-2007 required to be tested to establish a HAC rating

¹¹ The grant note HX is applied to all line entries on the 731 form that represent air interfaces/bands not defined in C63.19-2007, have ability to support voice over data applications and the phone has other air interfaces/bands that have been tested to establish a HAC rating.

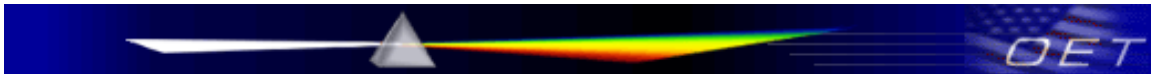


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- ii. When multiple models¹² are marketed with different HAC ratings under the same FCC ID, indicate the HAC ratings by listing the ratings for each model: “M#T#-200N, M#T#-200N”;¹³
 - b. For air interfaces/bands not included in C63.19-2007 that have voice capability (for which the grant note HX is used) the text: *“This mode of operation has the means to permit held to the ear telephone calls but has not been tested for hearing aid compatibility. The device supports other modes which have been found to be compliant with the HAC rules”* will automatically be added to the grant.
 - c. If the HAC rating requires a user-selectable mode reducing the power for the GSM air interface in the 1900 MHz band,¹⁴ then the following grant comment text shall be added: *“HAC rating requires user activation of a special mode for GSM operation in the 1900 MHz band.”*
- 13. Manual and other Exhibits: The Form 731 application for certification or permissive change shall include a statement of qualification for handsets using the power reduction option for GSM operations in the 1900 MHz band as well as an example or exhibit of all applicable disclosure statements in the user’s manual or elsewhere as required in Section 20.19(f).
 - a. Statement of qualification: If an applicant uses the power reduction option for the GSM 1900 MHz band, the applicant shall provide a declaration of compliance that “‘Applicant name’ provides one or two handset models over the GSM air interface and is required to offer a HAC GSM model under Section 20.19(e)(1)(B). FCC ID XYXABC requires a user selectable power reduction option for operation in the GSM 1900 MHz band for compliance.”
 - b. User manual:
 - i. An explanation of the ANSI C63.19 rating system per Section 20.19(f)(1);
 - ii. For HAC-rated handsets that operate with voice capability over both C63.19-2007 defined and not defined air interfaces/bands (grant note “HX”), disclosure statement(s) per Section 20.19(f)(2);
 - iii. For HAC-rated handsets operating over the GSM air interface in the 1900 MHz Band with a user-selectable mode for reducing the power under the provisions of Section 20.19(c)(1), a disclosure statement as defined in Section 20.19(f)(3).

¹² The grant comment must list all HAC ratings for handsets under one FCC ID offered to carriers if any model is reported to the Commission as HAC-compliant. The format is “HAC Ratings: M#T#-200N, M#T#-200N” after the (:) with each distinctive rating/model separated by a (,).

¹³ The grant comment “HAC rating only evaluated for the specific configurations described in this filing” is no longer required.



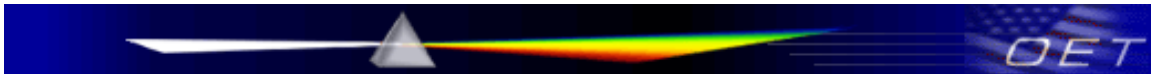
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Permissive Changes, Product Changes and Model Variations

14. Multiple compliance reports under one FCC ID that represent distinct models¹⁴ with different HAC ratings are permissible. A Form 731 application is required for each model variant that has a distinct HAC rating. After the initial Form 731 application for the first model, subsequent Form 731 applications for a Class II permissive change request shall be filed. As noted in Item 2 each Form 731 application must contain a complete HAC compliance report for all applicable air interfaces/bands.
15. Any changes that affect the HAC rating must be reported as a Class II permissive change.¹⁵ The handset must be given a new model designation distinct from that of the prior version of the handset.
16. A Class II permissive change application that only includes an M rating report for a handset previously granted with a rating of M#T# is only acceptable if (1) the handset is no longer to be marketed or reported with a rating of M#T#, or (2) there are HAC model variations. The grant comment associated with the Class II permissive change would then be “HAC Rating: M#” or “HAC Ratings: M#T#, M#” for examples 1 and 2 respectively. For cases where the modified equipment continues to be marketed and reported with a rating of M#T#, revised test data must be submitted in both the M and T reports. If the modification to the equipment results in a change in the HAC rating, a new model designation distinct from that of the handset is required.
17. When adding a T-coil rating for a device according to the Class II permissive change procedures for handsets, a complete M and complete T report must be submitted with the Form 731 application. Only if there has been no product change to add the T-coil rating may the previously filed report be resubmitted.

¹⁴ Distinct models are defined in Section 20.19(a)(3)(iii). If a manufacturer assigns different model designations solely to distinguish units sold to different carriers (for either the same or different FCC ID), or to signify other distinctions that do not relate to either form, features, or capabilities, such designations shall not count as distinct models for purposes of compliance to the required schedules set out in Sections 20.19(c) and (d).

¹⁵ ANSI C63.19 M rating measurements evaluate the near fields of the RF electrical and magnetic fields at a distance of 1 or 1.5 cm (ANSI C63.19-2006 used 1 cm (not currently applicable for new 731 applications) and ANSI C63.19-2007 uses 1.5 cm) from the surface of the handset earpiece. Any type of equipment modification (antenna position, design, metallic surface, adding system processes, changing battery capacity or type, etc.) has the potential to change the rating. The manufacturer must evaluate the equipment modification to determine if there is a change in the rating and if a Class II permissive change is required. Equipment changes that do not result in a change of the HAC rating being marketed and reported to the WTB do not require a Class II permissive change Form 731 application, and can be considered a Class I permissive change.



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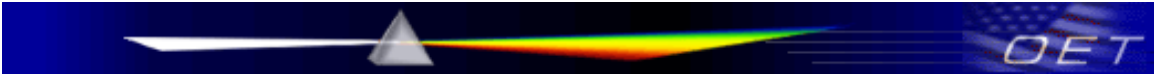
18. If the manufacturer builds the product with alternative components, it must be tested to show compliance using the components representing the worst case situation, according to the guidance for the permissive change rules.¹⁶

Features to be Tested

19. No external special parts or ancillary devices are permitted in order to demonstrate HAC compliance.
20. Handset models with user instructions that disable any of its features, degrade performance, reduce RF output power, degrade battery performance, etc. for the purpose of meeting HAC compliance are not permitted. However, power reduction is permitted for the GSM air interface in the 1900 MHz Band for qualified manufacturers¹⁰ of handsets using a user-selectable mode of reducing the power by no more than 2.5 dB under the provisions of Section 20.19 (c) (1). Handsets using this provision must be noted in the test report and provide the appropriate text in the grant comment field and disclosure statements (see Items 10, 11, 12 and 13 above).
21. Settings may be acceptable for processing audio signals in accordance with ANSI C63.19-2007 requirements, in order to improve the performance for people with hearing loss. A clear description of these controls must be provided in the test report submitted with the application.
22. The antenna must be tested in a position of maximum antenna efficiency for voice operation when held to the ear. When there is more than one position, for example stowed, deployed, keyboard extended, etc., only the position of maximum antenna efficiency for held to the ear voice calls, as defined by the manufacturer, must be tested. Any positions not tested that can result in an increase of the antenna efficiency must not be considered traditional, or practical, for held to ear voice operation. The FCC shall be contacted for further guidance and approval if the tested antenna position is other than a traditional position, and an explanation from the manufacturer regarding the tested antenna position shall be provided.
23. The rating for a handset must be in accordance with the method defined by ANSI C63.19-2007, and the M and T ratings can be decoupled as permitted under ANSI C63.19-2007.
24. In addition to the documentation to define the air interfaces/bands (see Items 10, 11, 12 and 13 above), the application shall document all other key marketed features¹⁷ of the tested model(s), including:

¹⁶ Permissive Change Policies – KDB 178919 Appendix A.

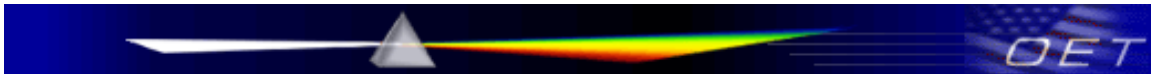
¹⁷ An applicant has the option to submit the description of the EUT as a separate exhibit in the Operational Description, and request long term or short term confidentiality.



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- a. Special HAC audio configurations permitted in accordance with ANSI C63.19-2007;
 - b. Statements regarding special antenna positions for HAC compliance (see Item 22 above).
- 25. The applicant shall provide a general declaration, if specific transmission modes do not operate in the held to ear mode for providing handset service (i.e., held to ear modes do not include Wi-Fi, Bluetooth profile).
- 26. Use of any feature not discussed above that is disabled during testing must be clearly documented in the test document.





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Appendix A: Example of Test Report

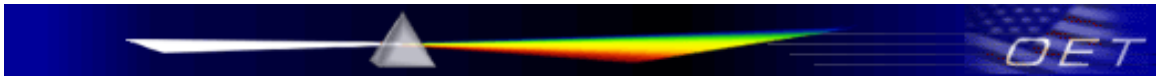
1. Summary
2. Air Interfaces and Bands
3. Test Site Description
4. Description of Test System
5. Equipment List
6. Description of EUT
 - a. Model Modes Features and Capabilities
 - b. Justification of Held to Ear Modes Tested
7. Test Procedure
8. Test System Validation, Calibration and Alignment Procedures
9. Detailed Measurements for M and T Ratings
10. Measurement Uncertainty
11. Calibration Certificates
12. References and Supporting Test Data
13. Detailed Test Measurement Plots

Appendix B: Background

Prior to October 2010, handsets subject to the HAC rules (20.19) could only include air interfaces/bands that were defined in ANSI C63.19. If a handset included air interfaces/bands capable of voice operations⁷ not defined in ANSI C63.19, it could not be rated for HAC compliance. The exception was for handsets that supported voice capability over Wi-Fi. In this single instance, manufacturers had to disclose to users that this handset was not HAC rated when operating over Wi-Fi. In addition, the previous rules did not require manufacturers that made available only one or two models (therefore qualifying under the *de minimis* exception) to provide HAC handsets.

The current rules² now permit handsets to be rated for HAC compliance that also support voice capability in other air interfaces/bands not defined in C63.19-2007. In this case, manufacturers must submit test report exhibit(s) demonstrating a HAC rating for the handset's air interfaces defined in ANSI C63.19-2007, and must disclose to users that all air interfaces/bands have not been tested to indicate that the handset is capable of supporting other voice-capable interfaces.

In addition, the *de minimis* exception has been changed and now only manufacturers that have 750 employees or less may be permanently exempt from providing HAC handsets. Beginning September 8, 2012, Manufacturers that have had more than 750 employees for at least two years and have offered handsets for at least 2 years, but only offer one or two digital wireless handsets over an air interface, are no longer exempt and must provide at least one handset model that is M and T rated. Manufacturers that fall into this category have an option to comply with the M rating for the GSM 1900 MHz band by reducing the power through a user-selectable option (20.19(e)(1)(C)).



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The new rules change the information required for demonstrating HAC compliance submitted in the exhibit(s) accompanying a Form 731 application. See Items 10-13 above.

Change Notice:

285076 D01 HAC Guidance v01 has been changed to a new revision under the same version to 285076 D01 HAC Guidance v01r01

- a. Item 15 of 285076 D01 HAC Guidance v01 has been changed to (see Item 15 above)
- b. From - 15. Only held to ear modes need to be tested. The Form 731 application exhibits shall include a clear description justifying the features activated, or not activated, during testing. – of 285076 D01 HAC Guidance v01
- c. Item 16 has been added (which was the second sentence of Item 15 of 285076 D01 HAC Guidance v01)
- d. Items 16 through 24 of 285076 D01 HAC Guidance v01 are now 17 through 25 of 285076 D01 HAC Guidance v01r01

12/15/2010: 285076 D01 HAC Guidance v01r01 has been changed to 285076 D01 HAC Guidance v02
Major revisions have been implemented due to FCC 10-145 released August 5, 2010 and effective October 8, 2010 which revised the Hearing Aid Compatibility rules in Section 20.19.

01/25/2011: 285076 D01 HAC Guidance v02 has been changed to 285076 D01 HAC Guidance v02r01
Clarification to paragraphs 5, 11 and 12 have been made for using the grant note HX.